

I CLAIM:

1. A method for energy storage and recovery for load moving machinery, the steps comprising

powering said machinery by a DC motor which is controlled by a diode converter,

driving said DC motor to act as a generator and create reverse power when lowering or braking a load, said reverse power combined with unused power when said load hoisting machinery is at small load or idle, said combined powers being defined as rest power,

utilizing said rest power for driving an induction motor through an inverter,

controlling said rest power by said inverter,

rotating a flywheel by said induction motor to store said rest power, and

rotating said induction motor by said flywheel to supply power through said inverter to said DC motor when said motor is consuming power in excess of its average power consumption.

2. The method of claim 1 including

generating a rotational speed signal proportional to the rotational speed of said flywheel,

measuring the voltage at the power input side of said DC motor,

transmitting said rotational speed signal and said measured voltage to a programmable logic controller, and

comparing said measured voltage in said controller with a preset value for determining whether said induction motor should be drive or be driven by said flywheel.

3. The method of claim 2 wherein said controller determines that if said measured voltage is higher than said set value, said inverter converts DC to AC with the frequency corresponding to said rotational speed plus alpha whereby said flywheel is accelerated by said induction motor and energy is stored in said flywheel rotation, and if said voltage is lower than said set value, said inverter controls the AC with the frequency corresponding to said rotational speed minus alpha whereby said flywheel is decelerated by said induction motor thereby generating reverse power which is supplied through said inverter to said DC motor whereby power is recovered from said flywheel rotation.

4. A load moving machinery energy storage system comprising
a direct current (DC) motor interconnected to a wire rope drum for raising and lowering a load, said motor being controlled by a diode,
an energy storage system including
a flywheel for storing and discharging energy, said flywheel being driven by an induction motor controlled by an inverter and driving a pulse generator;
a programmable logic controller (PLC) controlling said inverter,
means for sensing voltage at the power input side of said DC motor,
programmed logic for said programmable logic controller for comparing said sensed voltage and the output of said pulse generator with a set voltage value, and

an engine driven AC generator (ACG) producing power for said load moving machinery and delivering power to said DC motor through a diode.